NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

SEDIMENT BASIN

(No.)

CODE 350

DEFINITION

A basin constructed to collect and store debris or sediment.

PURPOSE

- Preserve the capacity of reservoirs, wetlands, ditches, canals, diversions, waterways, and streams
- Prevent undesirable deposition on bottom lands and developed areas
- Trap sediment originating from construction sites or other disturbed areas
- Reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural waste solids, and other detritus

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where physical conditions or land ownership preclude treatment of a sediment source by the installation of erosion control measures to keep soil and other material in place or where a sediment basin offers the most practical solution to the problem.

CRITERIA

Sediment basin design and construction shall comply with all applicable federal, state, and local laws, rules, and regulations.

The capacity of the sediment basin shall equal the volume of sediment expected to be trapped at the site plus adequate capacity to control the runoff from the design storm during the planned useful life of the basin or the improvements it is designed to protect. If it is determined that periodic removal of sediment will be practicable, the capacity may be proportionately reduced.

Fabricated or concrete structures shall have a minimum of 0.5 foot freeboard. Earthen embankments shall have a minimum of 1.0 foot freeboard. Freeboard is measured from the design storage volume (sediment + storm runoff) to the top of the facility.

The design of dams, spillways, and drainage facilities shall be according to Pond (378), Grade Stabilization Structure (410), or according to the requirements in Technical Release 60 (TR-60), as appropriate for the class and kind of structure being designed.

Temporary basins having drainage areas of 5 acres or less and a total embankment height of 5 feet or less may be designed according to Water and Sediment Control Basin (638). The embankment shall have a minimum top width of 4 feet and side slopes of 2:1 or flatter. An outlet shall be provided of earth, pipe, stone, or other devices adequate to keep the sediment in the basin and to handle the 10-year, 24-hour storm discharge.

All disturbed areas shall be treated as soon as possible after construction ends to control erosion and prevent excess sediment from leaving the site.

Provisions shall be made for dewatering sediment pools, if necessary, for safety and vector control.

Fencing and other safety measures shall be installed as necessary to protect the public.

Sediment basins for agricultural waste such as manure, milk house waste water, or open lot runoff shall be designed according to Solid/Liquid Waste Separation Facility (632).

URBAN, DEVELOPING AREAS, AND CONSTRUCTION SITES

SUDAS, Chapter 7 guidelines can be used to design sediment basins in this section.

The minimum sediment storage volume shall be 0.5 watershed inches (0.5 acre-inches of sediment per acre of drainage area).

Sediment basins shall be cleaned out when the effective sediment storage capacity drops below 0.2 watershed inches. The elevation corresponding to this level shall be determined and given in the design data as a distance below the principal spillway crest or other convenient point of reference. (Storage of 0.5 watershed inches = 67 yd^3 or 1,815 ft^3 per acre of watershed. Storage of 0.2 watershed inches = 27 yd^3 or 726 ft^3 per acre of watershed.)

Temporary basins having drainage areas of 30 acres or less may be designed according to Water and Sediment Control Basin (638). When the watershed above a temporary basin has become stabilized the basin should be removed. Removal shall include shaping, re-vegetating, and stabilizing the area occupied by the basin.

CONSIDERATIONS

Large sediment basins may have an effect on the peak discharge rate from a watershed. Planners should consider this and take steps to mitigate any potential negative effects this may have on riparian habitat downstream from the structure.

Visual aesthetics may be a concern, especially in urban or suburban areas. To address these concerns, the basin could be designed to blend with the surrounding topography or plantings could be proposed to screen the view from surrounding homes or buildings.

The nesting success and survival rate of ground-nesting species will increase if mowing is delayed until after the nesting season during operation and maintenance operations.

Using native species for revegetation will increase habitat diversity.

PLANS AND SPECIFICATIONS

Plans and specifications for installing sediment basins shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

The following list of Construction Specifications is intended as a guide to selecting the appropriate specifications for a specific project. The list includes most, but may not contain all, of the specifications needed for a specific project:

IA-1 Site Preparation
IA-3 Structural Removal
IA-5 Pollution Control
IA-6 Seeding and Mulching for Protective Cover
IA-11 Removal of Water
IA-21 Excavation
IA-23 Earthfill
IA-24 Drainfill
IA-26 Topsoiling
IA-27 Diversions
IA-31 Concrete
IA-32 Concrete for Nonstructural Slabs
IA-45 Plastic (PVC, PE) Pipe
IA-81 Metal Fabrication and Installation
IA-83 Timber Fabrication and Installation
IA-92 Fences

Provisions for controlling erosion and reducing sediment loss will be included. Specify rates of seed, mulch, fertilizer, appropriate planting dates, and method(s) of establishment.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan shall be developed that is consistent with the purpose of the practice, its intended life, safety requirements, and the criteria for its design. The sediment basin will be inspected after major storms for damage that may affect its function and performance. Any damage will be promptly repaired.

Necessary maintenance will be performed in a timely manner in order to protect the facility and its ability to perform as planned.

REFERENCES

Iowa Statewide Urban Design and Specifications (SUDAS), Chapters 7E-26, Sediment Basin, and 7E-27, Sediment Trap www.iowasudas.org